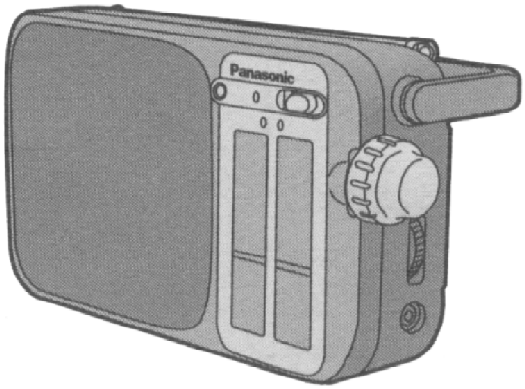
ORDER NO. AD0104103C3

Service Manual

FM-AM 2-BAND RECEIVER

RF-2400

Colour
(S).....Silver Type
Areas
(GN).....Oceania.



SPECIFICATIONS

Specifications

Radio frequency range:	
FM;	**87.50-108.00MHz**
AM;	**520-1610kHz**
Intermediate frequency:	
FM;	**10.7MHz**
AM;	**459kHz**
Sensitivity:	
FM;	**3.16 μ V/50mW output (-3dB limit sens.)**
AM;	**141 μ V/m/50mW output (Max. sens.)**
Output jack:	**Earphone, 8 Ω**
Speaker:	**10cm**
Power output:	**770mW (RMS...max.)**
Power requirement:	
AC;	**230-240V, 50Hz**
DC;	**6V (four R6/LR6, AA, UM-3 batteries)**
Power consumption:	**3W**
Dimensions (W×H×D):	**234×122×82mm**
Mass (without batteries):	**670g**
Play time:	
(When used at 25°C on a flat, stable surface)	
Panasonic alkaline dry cell battery:	**AM; About 47 hours**
	Fm; About 36 hours
The play time may be less depending on the operating conditions.	
Note:	
Specifications are subject to change without notice.	
Mass and dimensions are approximate.	
Supplied accessory:	**AC mains lead (RJA0035-X)...1pc.**

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⚠ WARNING

This service information is designed for experienced repair technicians only and is not designed for use by the general public.
It does not contain warnings or cautions to advise non-technical individuals of potential dangers in attempting to service a product.
Products powered by electricity should be serviced or repaired only by experienced professional technicians. Any attempt to service or repair the product or products dealt with in this service information by anyone else could result in serious injury or death.

Panasonic®

1. Operation Checks and Component Replacement Procedures

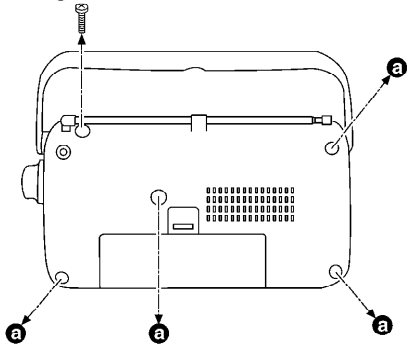
- This section describes procedures for checking the operation of the major printed circuit boards and replacing the main

components.

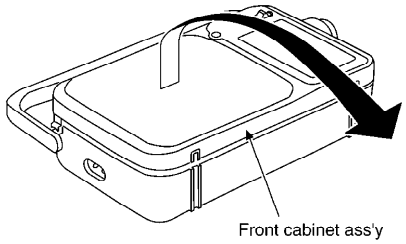
- For reassembly after operation checks or replacement, reverse the respective procedures. Special reassembly procedures are described only when required.

1.1. Checking for the main P.C.B.

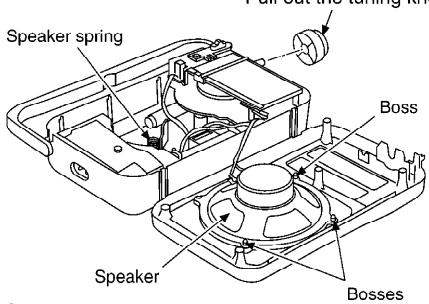
(Step 1)
ⓐ × 5



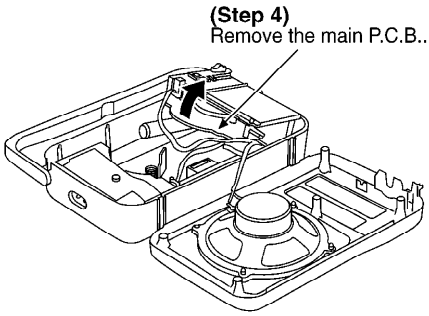
(Step 2)
Remove the front cabinet ass'y, and then put the it in the direction of arrow.



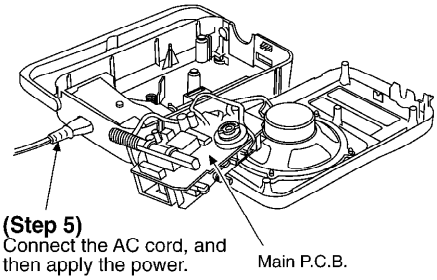
(Step 3)
Pull out the tuning knob.



NOTE:
1. Take care not to remove the speaker because it is fixed with 3 bosses of front cabinet ass'y.
2. Take care not to lose the speaker spring because it is removed easily.

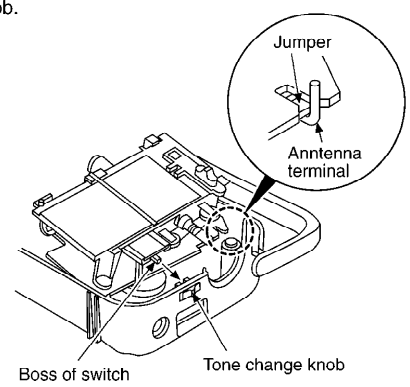


- Check the main P.C.B. as shown below.

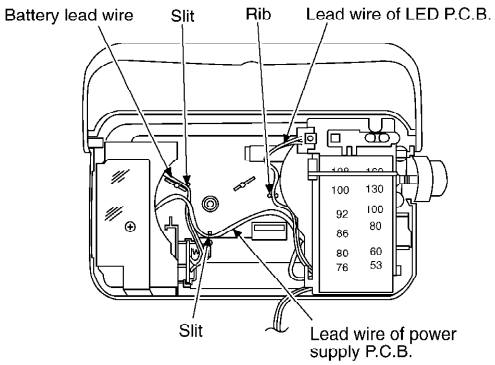


Notice for installation of main P.C.B.

1. The anntenna terminal should be contacted to jumper.
2. Align the boss of switch with the bent of tone change knob.



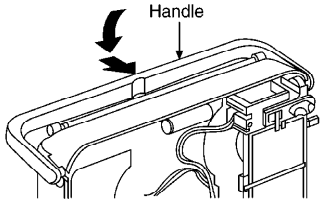
Line arrangement



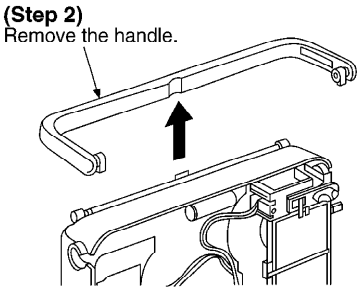
1.2. Replacement for the handle

- Follow the (Step 1) , (Step 2) of item 1.1.

(Step 1)
Tilt the handle to rear side and then push it to front side.

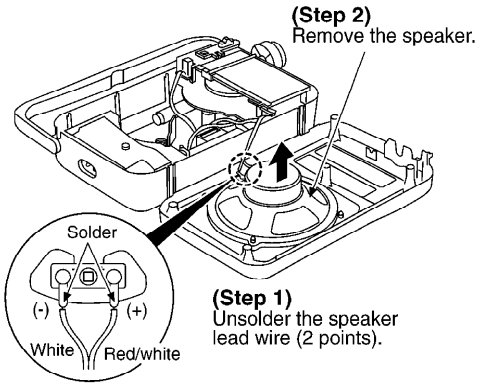


(Step 2)
Remove the handle.



1.3. Replacement for the speaker

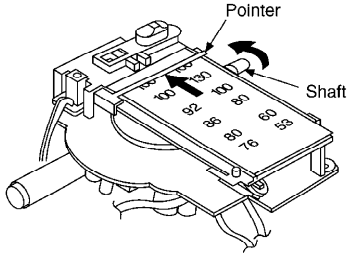
- Follow the (Step 1) , (Step 2) of item 1.1.



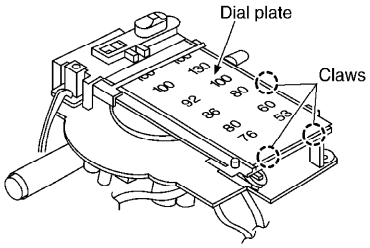
1.4. Replacement for the dial rope and pointer

- Follow the (Step 1) - (Step 4) of item 1.1.

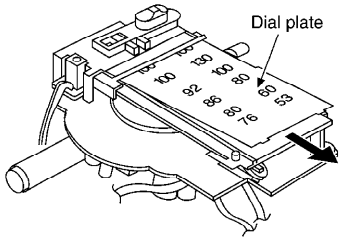
(Step 1)
Rotate the shaft, and then slide the
pointer in the direction of arrow.



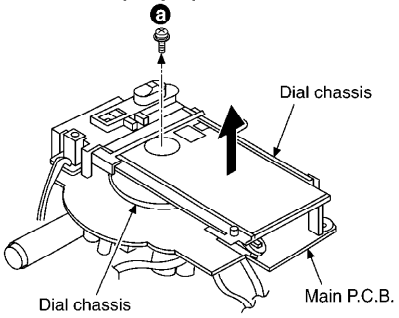
(Step 2)
Release the claws of dial plate.



(Step 3)
Remove the dial plate in the direction of arrow.

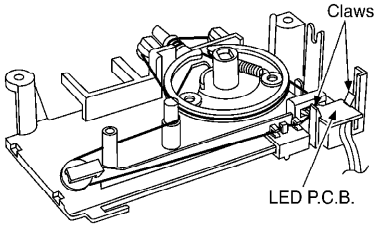


(Step 4)

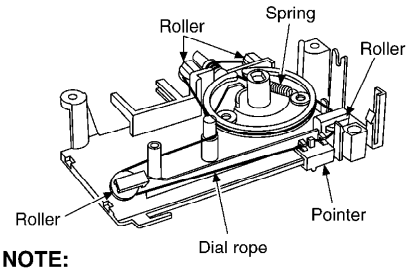


(Step 5)
With pulling the dial drum from the main P.C.B., remove the dial chassis together.

(Step 6)
Release the 2 claws, and then remove the LED P.C.B..

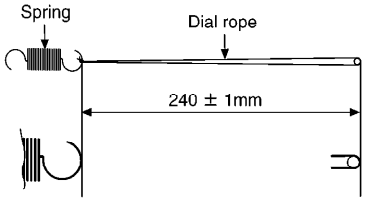


(Step 7)
Remove the spring, and then remove the dial rope and pointer.



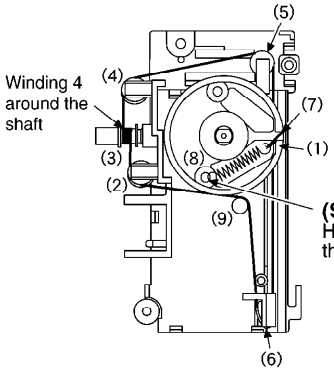
NOTE:
Take care not to lose the roller because it is removed easily.

Replacement of the dial tope



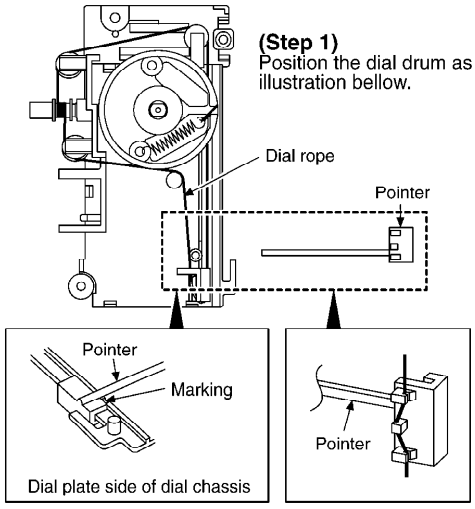
· Hanging the dial rope

(Step 2)
Hang the rope (1) - (9) below.



(Step 1)
Hang the spring to the hole of dial brum.

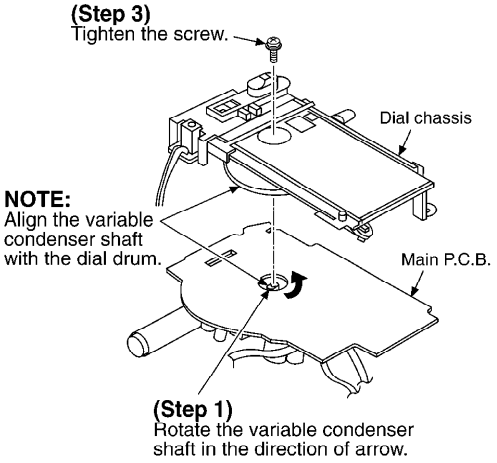
· **Installing the pointer (Adjusted 0 point)**



(Step 2)
Position the pointer to the marking and then hang the dial rope.

Installing the dial chassis

(Step 2)
Install the dial chassis adjusted 0 point to the main P.C.B..



2. Type Illustration of IC's, Transistors, and Diodes

3. Schematic Diagram

3.1. Schematic Diagram Notes

S1-1:

BAND switch in "FM" position.

S1-2:

POWER switch in "ON" position.

VR1:

Volume control VR.

- DC voltage measurements are taken with electronics voltmeter. The negative terminal of the battery provides negative meter connection point.

No mark.....

FM

( ).....

AM

- Battery current:

Vol. min.....

FM: 8.8mA (DC) / 3.9mA (AC)

AM: 6.0mA (DC) / 3.7mA (AC)

Vol. max.....

FM: 210mA (DC) / 7.8mA (AC)

AM: 200mA (DC) / 7.6mA (AC)

Measurement instruction

AM:

74dB/m, 30% Mod.

FM:

60dB, 30% Mod.

- Important safety notice

Components identified by ⚠ mark have special characteristics importan for safety. / When replacing any of these components, use only manufacturer's specified parts.

- This shematic diagram may be modified at any time with the development of new technology.

3.2. Schematic Diagram

4. Printed Circuit Boards

5. Measurements and Adjustment

5.1. ALIGNMENT INSTRUCTIONS

READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT
1. Set power source voltage to 230/240 V AC. 2. Set volume control to maximum. 3. Set band switch to AM, FM or LW. 4. Output of signal generator should be no higher than necessary to obtain an output reading.

- AM-IF ALIGNMENT

Signal Generator or Sweep Generator		Radio Dial Setting	Indicator (Electronic Voltmeter or oscilloscope)	Adjustment (Shown in Fig. 1)	R
Connections	Frequency				
Fashion a loop of several turns of wire and radiate signal into loop of receiver.	459 kHz 30% Mod. at 400 Hz	Point of non-interference. (on/ about 600 kHz)	Connect vert. amp. of scope to test point TP4. Negative side to test point TP5.	T2 (AM IFT)	Adj ma out

- AM-RF ALIGNMENT

Signal Generator or Sweep Generator		Radio Dial Setting	Indicator (Electronic Voltmeter or oscilloscope)	Adjustment (Shown in Fig. 1)	R
Connections	Frequency				
Fashion a loop of several turns of wire and radiate signal into loop of receiver.	511 kHz	Variable capacitor fully closed.	Connect vert. amp. of scope to test point TP4. Negative side to test point TP5.	L7 (AM OSC Coil)	Adju maxi outp
Fashion a loop of several turns of wire and radiate signal into loop of receiver.	1650 kHz	Variable capacitor fully opened.	Connect vert. amp. of scope to test point TP4. Negative side to test point TP5.	CT3 (AM OSC Trimmer)	Adju maxi outp
Fashion a loop of several turns of wire and radiate signal into loop of receiver.	600 kHz	Tune to signal	Connect vert. amp. of scope to test point TP4. Negative side to test point TP5.	[*1] L3 (AM ANT Coil)	Adju maxi outp by L mov alon ferri
Fashion a loop of several turns of wire and radiate signal into loop of receiver.	1500 kHz	Tune to signal	Connect vert. amp. of scope to test point TP4. Negative side to test point TP5.	CT4 (AM ANT Trimmer)	Adju maxi outp
[*1] Fix antenna coil with wax after completing alignment					

- FM-RF ALIGNMENT

Signal Generator or Sweep Generator		Radio Dial Setting	Indicator (Electronic Voltmeter or oscilloscope)	Adjustment (Shown in Fig. 1)	F
Connections	Frequency				
Connect to test point TP1 through FM dummy antenna. Negative side to test point TP2.	86.2 MHz	Variable capacitor fully closed.	Connect vert. amp. of scope to test point TP4. Negative side to test point TP5.	L5 (FM OSC Coil)	[*2] for out
	109.2 MHz	Variable capacitor fully opened.	Connect vert. amp. of scope to test point TP4. Negative side to test point TP5.	CT1 (FM OSC Trimmer)	[*2] for out
	106 MHz	Variable capacitor fully opened.	Connect vert. amp. of scope to test point TP4. Negative side to test point TP5.	CT2 (FM ANT Trimmer)	[*2] for out
[*2] Three output response will be present; proper tuning is the outer frequency.					

- FM-IF ALIGNMENT

Signal Generator or Sweep Generator		Radio Dial Setting	Indicator (Electronic Voltmeter or oscilloscope)	Adjustment (Shown in Fig. 1)	F
Connections	Frequency				
Connect to test point TP3 through ceramic capacitor. Negative side to test point TP2.	10.7 MHz (Sweep)	Point of non-interference. (on/about 90 MHz)	Connect vert. amp. of scope to test point TP4. Negative side to test point TP5.	T1 (FM IFT)	Wa sho Fig

5.2. Adjustment points

Fig. 1

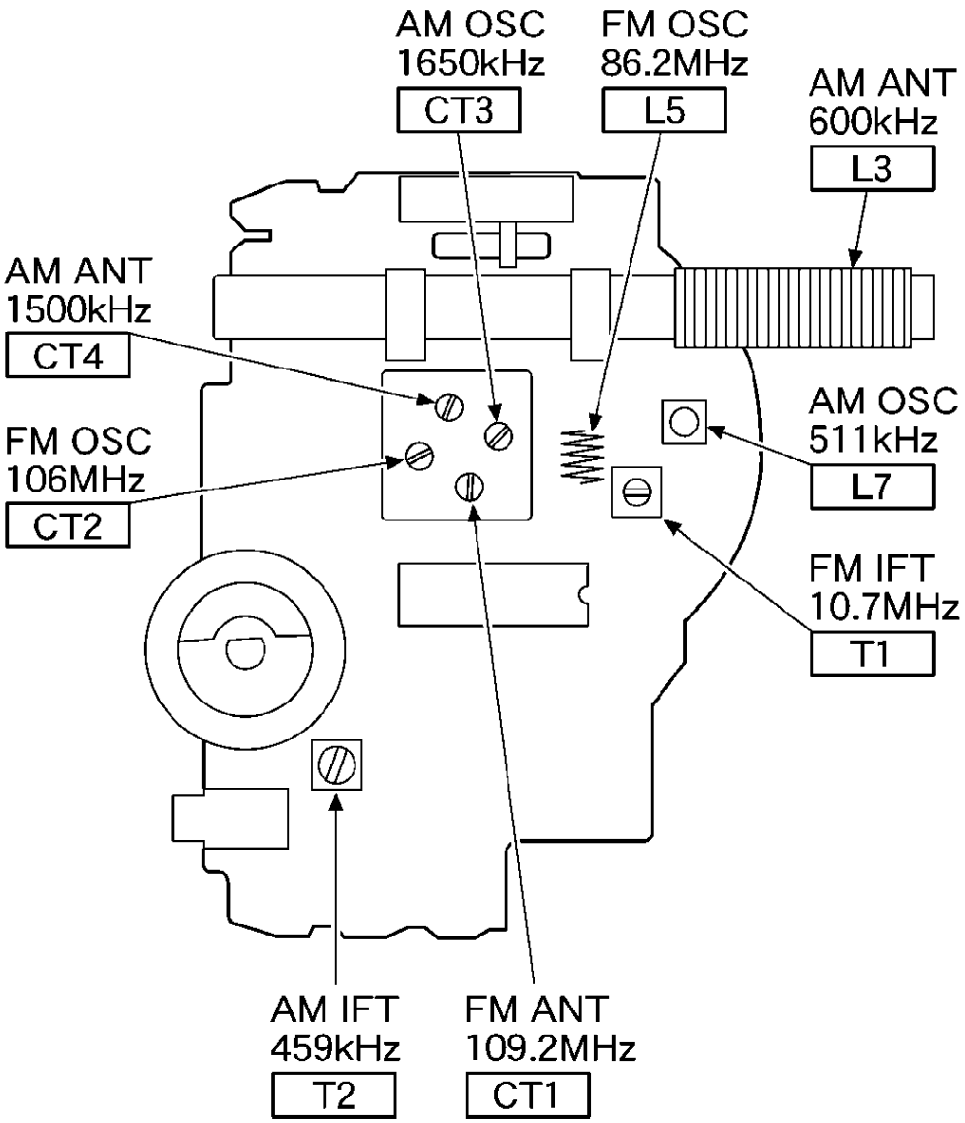
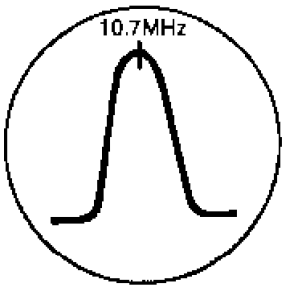


Fig. 2



6. Replacement Parts List

Note:

- Important safety notice: / Components identified by ⚠ ; mark have special characteristics important for safety. / Futhermore, special

parts which have purposes of fireretardant (resistors), high-quality sound (capacitors),low-noise (resistors), etc. are used. / When replacing any of components, be sure to use only manufacture's specified parts shown in the parts list.

- Capacity values are in microfarads (μ F) unless specified otherwise, 1K =1,000(ohm), 1M =1,000k(ohm)

- The "<IA>" mark in Remarks indicate language of instruction manual. / <IA>:English, Spanish, Chinese, Arabic.

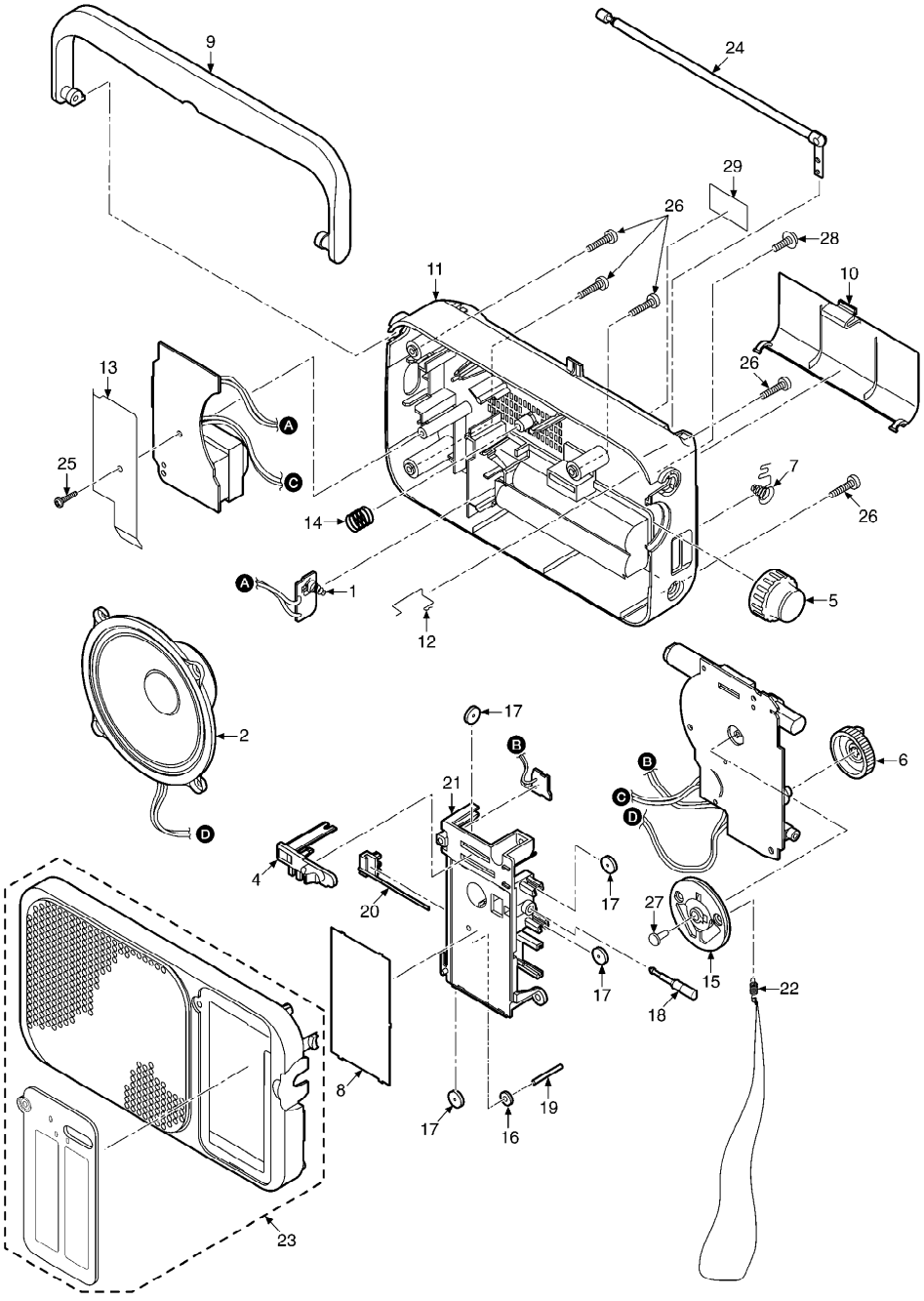
- The marking (RTL) indicates that the Retenition Time is limited for this item. After the discontinuation of this assembly in production, the item will continue to be available for a specific period of time. / The retention period of availabilityisdependant on the type of assembly, and in accordance with the laws governing part and product retention. After the end of this period, the assembly will no longer be avairable.

Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
1	RJCW70003	BATTERY TERMINAL(-)	1	
2	RAS10P34-G	SPEAKER	1	
4	RGVW0001-S	KNOB,FUNCTION	1	
5	RGWW0004-S	KNOB,TUNING	1	
6	RGWX0008-1H	KNOB,VOLUME	1	
7	RJCW93003	BATTERY TERMINAL(+/-)	1	
8	RKDW0001F-S	DIAL PLATE	1	
9	RKHX0001-1H	HANDLE	1	
10	RKKW0003-H	BATTEY COVER	1	
11	RKSW0019-H	BACK CABINET	1	
12	RMEW0002	ANT TERMINAL	1	
13	RMRX0020-2	PVC SHIELD	1	
14	RUQ50ZA	SPRING	1	
15	RDDW0001	DIAL DRUM	1	
16	RDR26ZA	ROLLER	1	
17	RDR54ZA	ROLLER	4	
18	RDT9133ZB	TU SHAFT	1	
19	RDY31A	PULLEY SHAFT	1	
20	RGJW0002-D	POINTER	1	
21	RMKW0005	DIAL CHASSIS	1	
22	RXQW0001	DIAL ROPE UNIT	1	
23	RYKW0041-S	FRONT CAB ASS'Y	1	
24	XEARK160DA-C	ROD ANTENNA	1	
25	XTV3+12G	SCREW	1	
26	XTV3+14G	SCREW	5	
27	XYN26+C6	SCREW	1	
28	XYN3+F8FY	SCREW	1	
29	RGNW0031-S	NAME PLATE	1	
A1	RQT5885-G	O/I BOOK	1	<IA>

Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
A2	RQCB0169	SERVICE CENTER LIST	1	
A3	RJA0035-X	AC MAINS LEAD	1	⚠
C1	ECBT1H470J5	50V 47P	1	F1D1H470A006
C2	ECBT1H5R6KC5	50V 5.6P	1	F1D1H5R6A017
C3	ECFR1C153MR	16V 0.015	1	
C4	ECBT1H101KB5	50V 100P	1	F1D1H101A012
C5	ECBT1H150JC5	50V 15P	1	
C6	ECBT0J223NS5	6.3V 0.022U	1	F1DZZ2230002
C7	ECEA1CKS100	16V 10U	1	
C8	ECBT1H8R2KC5	50V 8.2P	1	
C9	ECBT1H200JC5	50V 20P	1	F1D1H200A015
C10	ECBT1H8R2KC5	50V 8.2P	1	
C11	ECBT1H010MC5	50V 1P	1	F1D1H1R0A019
C12	ECBT0J223NS5	6.3V 0.022U	1	F1DZZ2230002
C13	ECBT1H150JC5	50V 15P	1	
C14	ECA1HM4R7B	50V 4.7U	1	
C15	ECEA1HKS010	50V 1U	1	
C16	ECFR1C223KR	16V 0.022U	1	F1C1C223A001
C17	ECA1HM010B	50V 1U	1	
C18	ECA1CM330B	16V 33U	1	
C19	ECA0JM471	6.3V 470U	1	
C20	ECEA1HKS2R2	50V 2.2U	1	
C21	ECFR1C223KR	16V 0.022U	1	F1C1C223A001
C22	ECA1AM222	2200U	1	⚠
C23	ECA0JM471	6.3V 470U	1	
C24	ECA1CM330B	16V 33U	1	
C25	ECBT1H102KB5	50V 1000P	1	F1D1H102A012
C26	ECA1CM100B	16V 10U	1	
C28	ECFR1C223KR	16V 0.022U	1	F1C1C223A001
C29	ECBT1H2R7KC5	50V 2.7P	1	
C30	ECBT1H1R5MC5	50V 1.5P	1	F1D1H1R5A019
C101-04	ECKR1H103ZF5	50V 0.01U	4	F1B1H1030001
CF1	RVF107WDZT	CERAMIC FILTER	1	
CF2	RVFSFU459B	CERAMIC FILTER	1	
D101-04	RVD1SR139TA	DIODE	4	⚠
F1	XBA2C025TB0L	FUSE	1	⚠
IC1	CXA1619BS	IC,FM/AM IF	1	
JK1	RJJD3M9ZA-H	JACK,INSIDEPHONE	1	
JK101	RJJ1SE01-X	JACK,AC IN	1	⚠
L1	RLQY18S3W-F	COIL	1	
L2	RLQY50S5-0	COIL	1	
L3	RLV2C052-0	COIL	1	
L5	RL04Y93W-F	COIL	1	
L7	RL02B013-T	COIL	1	
L8	RLQA2R2KT-G	COIL	1	
L101,02	RLQZB1R0KT-D	COIL	2	⚠

Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
LED1	HFR365P	TUNNING LED	1	
P1	RPKW0028	GIFT BOX	1	
P2	RPN1375	CUSHION	1	
P3	XZB30X25A04	POLYETHYLENE SHEET BAG	1	
PCB1	REPW0009D	P.C.B. ASS'Y	1	(RTL)
R1	ERDS2FJ821	1/4W 820	1	
R2	ERDS2FJ122	1/4W 1.2K	1	
R3	ERDS2FJ152	1/4W 1.5K	1	
R4	ERDS2FJ122	1/4W 1.2K	1	
R5	ERDS2FJ331	1/4W 330	1	
R6	ERDS2FJ332	1/4W 3.3K	1	
S1	RSS3B020-B	SW,POWER/BAND	1	
T1	RLI4B153-F	TRANSFORMER	1	
T2	RLI2B471-M	TRANSFORMER	1	
T101	RTP1I1B002-V	POWER TRANSFORMER	1	⚠
VC1	RCV4LCT0V-R	VC	1	
VR1	RRV12A04B14S	VR,VOLUME	1	

7. Cabinet Parts Location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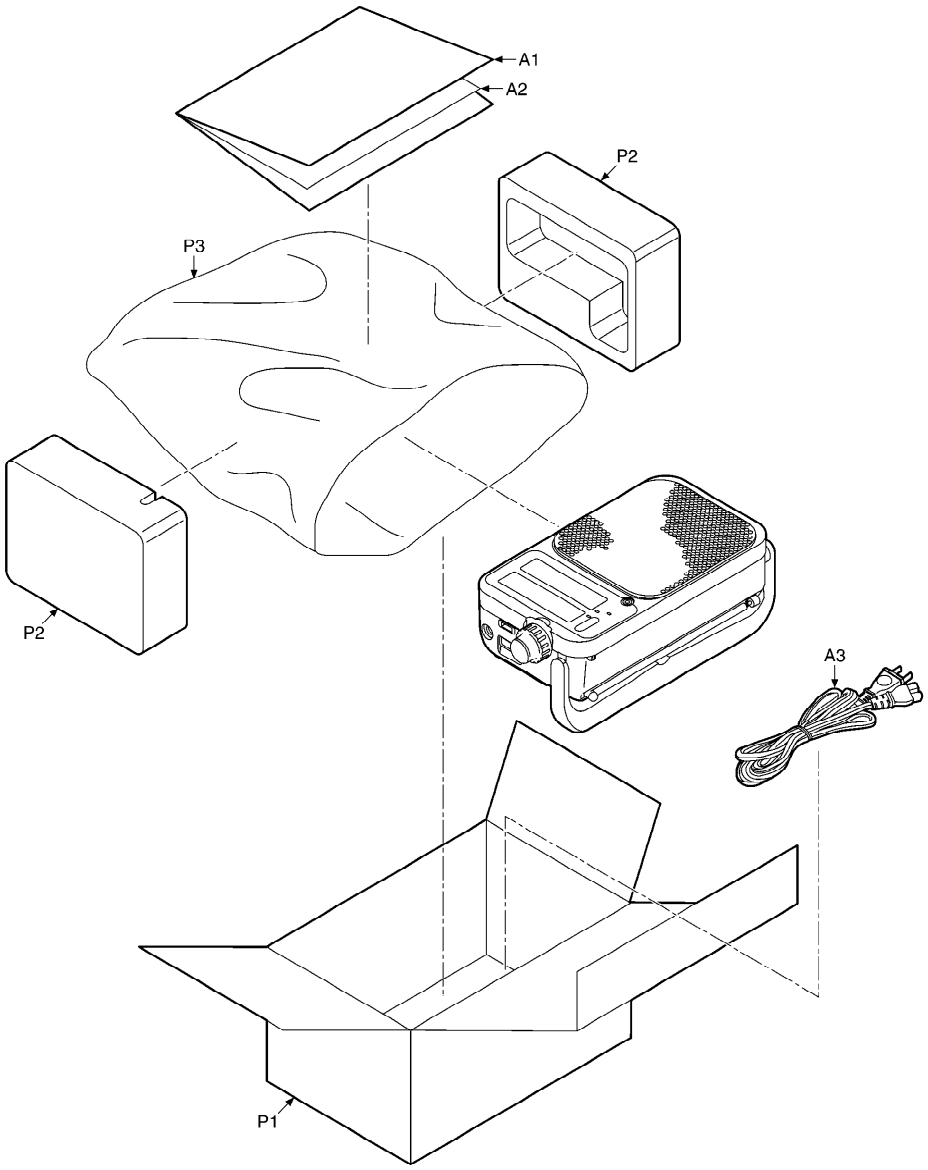
8. Packaging



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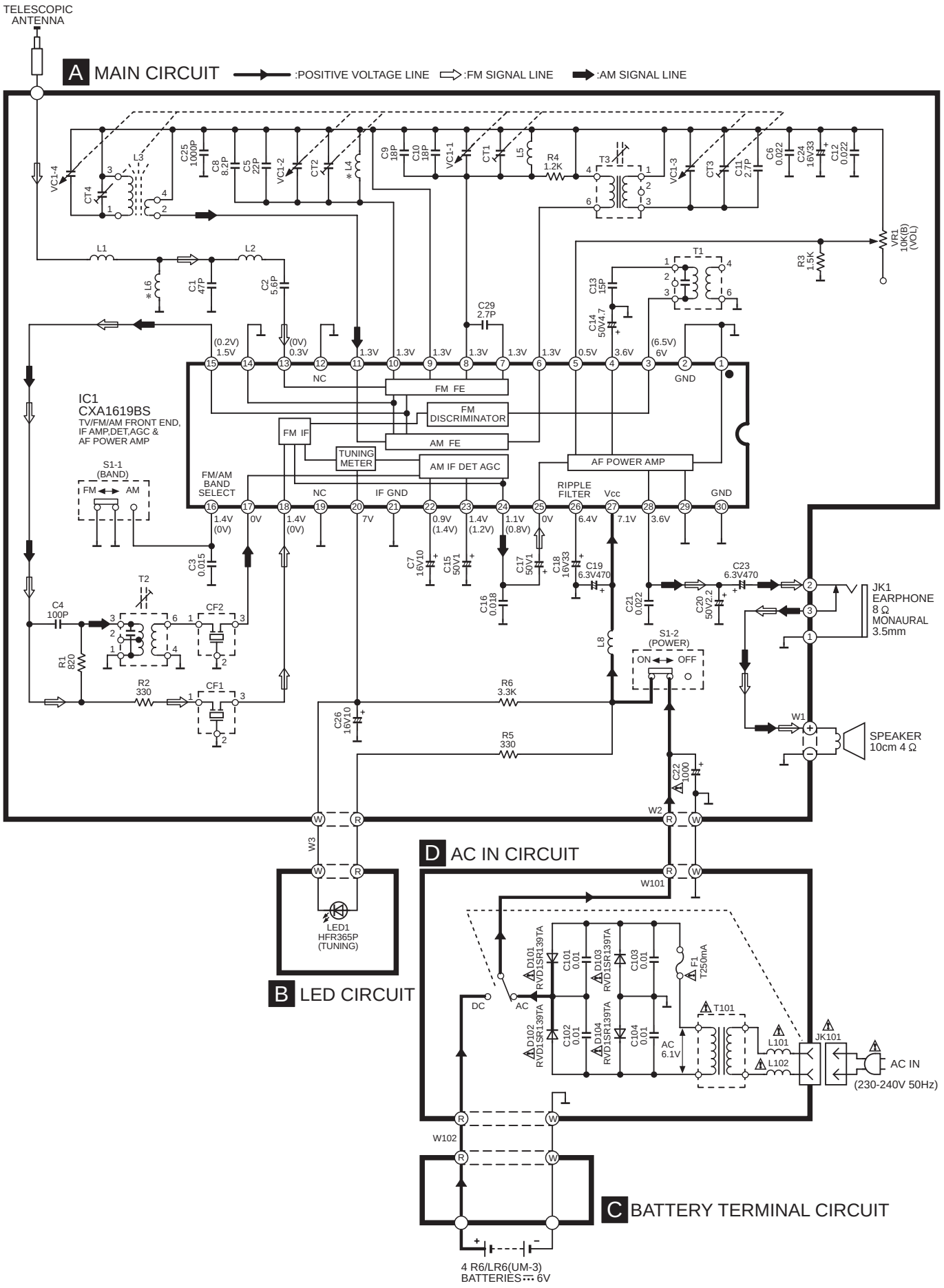
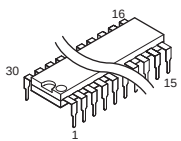
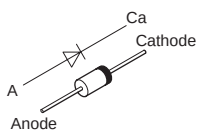
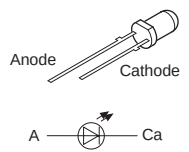

TELESCOPIC ANTENNA
A MAIN CIRCUIT
:POSITIVE VOLTAGE LINE
:FM SIGNAL LINE
:AM SIGNAL LINE
IC1
CXA1619BS
TV/FM/AM FRONT END, IF AMP,DET,AGC & AF POWER AMP
FM FE
FM DISCRIMINATOR
FM IF
AM FE
TUNING METER
AM IF DET AGC
AF POWER AMP
S1-1 (BAND)
FM/AM BAND SELECT
IF GND
RIPPLE FILTER
Vcc
GND
NC
S1-2 (POWER)
ON
OFF
JK1
EARPHONE 8 Ω MONAURAL 3.5mm
SPEAKER 10cm 4 Ω
W1
W2
W3
LED1 HFR365P (TUNING)
B LED CIRCUIT
D AC IN CIRCUIT
W101
W102
DC
AC
AC 6.1V
AC IN (230-240V 50Hz)
C BATTERY TERMINAL CIRCUIT
4 R6/LR6(UM-3) BATTERIES 6V

CXA1619BS	RVD1SR139TA	HFR365P
		

Note: This printed circuit board diagram may be modified at any time with the development of new technology.